Work Order <i>July-11-12 9:44:1</i>			*871	156*			سو			Page 1	
Item ID: De Revision ID:	412-664-203TRN		Accept	*N900	040	100)* 5	Setup Star	* *N	S1*	Ξ
	rosstube Turning Detail			•				Sto	*N	S2*	
Start Date: 7/2 Required Date: 8/	20/12 Start Qty: 1.0 0 3/12 Req'd Qty: 1.0	•		Cust Item I	D:			 	 *-		
Reference:		. •							*		
• •	Process Plan:	Date:	✓ Tooling:_ SPC (Y/N):		ate:		I	Run Stai Sto	I/I	R1* R2*	
Sequence ID/ Work Center ID	Operation Description		Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp	
Draw Nbr	Revision Nbr										
D412-664-243	Rev E(DEO)										
100			0.00								
100 Mori Seiki	MORI SEIK! CNC	LATHE LARGE	0.00					Ø			
Mori Seiki CNC Lathe	Large 1-Fill to 2-Turn 3- File	the with sand & install plugs I first side as per Folio FA166 ransition lines smooth. REV:	OT8534 on both ends as po	er Folio FA166					*	12/07	n a 7/2
110		sions to dimension sheet	0.00			d					
110 QC	Memo	֥ .	0.00					- \$ _	· ·	gran	i
Quality Control				· ·						Wigh	1: -

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W/O:			WC	ORK ORDER CHANGES	3				
DATE	STEP	PRO	OCEDURE CHA	NGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC inspector
			· · · · · · · · · · · · · · · · · · ·						
Part No	•	PAR #:	Fault Cate	gory:	NCR: Yes	No DQ	A:	_ Date: _	
	R	esolution:	Dispositio	n: '	QA: N/C Clo	sed:		Date:	
NCR:		•	WORK ORD	ER NON-CONFORMAN	ICE (NCR)			
DATE	CTED	Description of NC		Corrective Action Section		Verific	ation	Approval	Approval
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Secti		Chief Eng	QC Inspector
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Work Order ID 87156 <i>July-11-12 9:44:16 AM</i>			*87156*							ige 2	
Item ID: Revision ID:	D412-664-	203TRN		Accept	*N900	040	100)* s	etup Star	11/2/1	*
Item Name:	Crosstube T	urning Detail							Stop	*NS2	*
Start Date:	7/20/12	Start Qty: 1.00	*1*		Cust Item I	D:					
Required Date: Reference:	: 8/03/12	Req'd Qty: 1.00	*1*		Customer:						
Approvals:	Process P	Plan:	Date:	Tooling:	Da	ate:		R	un Star	"NR1	*
	QC:	and a shareholder The Addition for	Date:	SPC (Y/N):	Da	ate:			Stop	*NR2	*
Sequence ID/ Work Conter I	D	Operation Description		Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Insp. Number Stam	
120				0.00				,	1		
120		MORI SEIKI CNC LAT	HE LARGE						Ø	KC	12-7-22
Mori Seiki		Memo		0.00							
Mori Seiki CNC La	athe Large	2- File trans 3- Remove									
130		QC1- Inspect dimension	s to dimension sheet	0.00							
130								1	\varnothing	KC	12-7-20
QC		Memo		0.00							
Quality Control		+ PERFORI	M ULTRA SONIC MEAS	SUREMENT							
140		QC8- Inspect parts - seco	ond check	0.00			DAG				:

*14**0***

0.00

Quality Control

+ CHECK ULTRA SONIC MEASUREMENT AND ORIENTATION FOR BENDING

Dart Aerospace Ltd

	oopaoo									
W/O:			W	ORK ORDER CHANG	ES					
DATE	STEP	PR	OCEDURE CH	ANGE		Ву .	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
				•						
				•						
										•
Part No	:	PAR #:	Fault Cat	legory:	NCR:	Yes	No DQA	\:	Date:	
		esolution:								
NCD.			_	DER NON-CONFORMA						
NCR:							·,		T	T
DATE	STEP	Description of NC Section A	Initial	Corrective Action Sect Action Description	ion B	Sign 8	Verific		Approval Chief Eng	Approval QC Inspector
		Section A	Chief Eng	Chief Eng		Date	Section	on C	Chief Eng	QC inspector
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Work Ordo July-11-12 9:44		87156		*87′	156*							Page 3	
Item ID: Revision ID:		4-203TRN		Accept	*N900	<u>04</u> 0	100)* 5	Setup	Start Stop	I VI	S1*	
Item Name:	Crosstube	Turning Detail								этор	*N	S2*	
Start Date:	7/20/12	Start Qty: 1.00	*1*		Cust Item 1	ID:							
Required Date:	8/03/12	Req'd Qty: 1.00	*1*		Customer:								
Reference:					•								
Approvals:	Process	Plan:	Date:	Tooling:	D	ate:		I	Run	Start	*N	R1*	
	QC:		Date:	SPC (Y/N):	D	ate:				Stop	*N	R2*	
Sequence ID/ Work Center I	D	Operation Description		Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Rej Qty		Reject Number	Insp. Stamp	
145		:		0.00				_					
145							_	Ken		12 -	7-	25	
Crosstubes		Мето		0.00				, , .	•	· _	•		
Crosstubes		GRIND ON.	LY TRANSITION LINES	SMOOTH LONGITUDE	E WAY.					-			
150				0.00					/		_		
150				0.00				KM	/sa-A	112-	7-	25	
HandFXtube Hand Finishing Cro	acctubac *	Memo	RE WASH X-TUBE INSI.	0.00					[[])			
riand rinishing Cit	ossiuoes				TOUR DRIVE			,	. 10				
		2- ACID ET	CH X-TUBE INSIDE AN	DOUT. USE RED SCO	ICH BRITE								
160		QC5- Inspect part compl	eteness to step on W/O	0.00		0,3	So,	N				•	
160		Memo		0.00		` 69	Ĭ	1		-+1	} _)_2×	_

Quality Control

Dart Aerospace Ltd

									
W/O:			W	ORK ORDER CHANGES	3				
DATE	STEP	PROCI	EDURE CHA	NGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
N,									
Part No	•	PAR #:	Fault Cate	egory:	NCR: Yes	No DQ	A:	Date: _	
	Res	solution:	Disposition	on: <u>`</u>	QA: N/C CI	osed:		Date: _	
NCR:		W	ORK ORD	ER NON-CONFORMAN	CE (NCR)			
DATE	STEP	Description of NC		Corrective Action Section		Verific	ation	Approval	Approval
	0.2.	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Secti	on C	Chief Eng	QC Inspector
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	Vork Order ID 87156 ly-11-12 9:44:16 AM			*87156*								Page
Item ID: Revision ID:	D412-664-			Accept	*N900	040	100)* s	Setup	Start Stop	171.	S1*
Item Name: Start Date: Required Date: Reference:	7/20/12	Start Qty: 1.00 Req'd Qty: 1.00	*1* *1*		Cust Item I Customer:	D:					IV.	S2*
Approvals:	Process P	Plan:	Date:	Tooling: SPC (Y/N):		nte:		ŀ	Run	Start Stop	. IVI	R1* R2*
Sequence ID/ Work Center II	D	Operation Description Packaging		Set Up/ Run Hours 0.00	Tool ID	Tool #	Plan Code	Accept Qty	Qty	Y	Reject Number	Insp. Stamp
170 Packaging Packaging		Memo	stock in kanban rack	0.00				Km	l	-12	7-	25

*18**0***

180

QC21- Final Inspection - Work Order Release

0.00

Memo

0.00

Quality Control

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Dart Aerospace Ltd

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W/O:			W	ORK ORDER CHANGE	S				6
DATE	STEP	PRO	OCEDURE CHA	NGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
									
								<u></u>	
Part No	:	PAR #:	Fault Cate	gory:	NCR: Yes	No DQ	A:	_ Date: _	
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NCR:	**************************************		WORK ORD	ER NON-CONFORMA	NCE (NCR)			
DATE	STEP	Description of NC		Corrective Action Section		Verific	ation	Approval	Approval
		Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Secti	on C	Chief Eng	QC Inspector
			,						
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July-11-12 9:44:16 AM

Work Order ID:

87156

Parent Item:

D412-664-203TRN

Parent Item Name:

Component Item ID/

Crosstube Turning Detail

Start Date: 7/20/12

Required Date: 8/03/12

Start Qty: 1.00

Required Qty: 1.00

Comments:

Item Name

D6009-129

IPP Rev:A 08-03-06 new issue DD verified by:eec

Manufactured

	IPP Rev B 08.04.0	2 Removed polis	sh EC	verified by: DD				r						
1	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status	
		Manufactured	No			120	Each	19.0000	i	1				_

Crosstube Material

Location LG

Loc Oty

Loc Code

* .

19 19

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1

Dart Aerospace Ltd

W/O:		WORK O	RDER CHANGE	S				
DATE	STEP	PROCEDURE CHANGE	\$	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
**************************************			<i>ξ</i> ,					

Part No: _	P/	\R #: F	ault Category	y:	NCR: Yes No	DQA:	Date:
	Resolution:		المراقعة Disposition: _	S. C. AM.	QA: N/C Closed	l:	Date:

NCR:		WORK ORDER NON-CONFORMANCE (NCR)												
		Description of NC		Corrective Action Section B	Verification	Approval	Approval							
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Chief Eng	QC Inspecto						
				Chief Eng										
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DART AEROSPACE LTD	Work Order:	87156
Description: Crosstube Assembly (412 High Aft)	Part Number:	D412-664-243
Inspection Dwg: D412-664-243 Rev: E		Page 1 of 2

FIRST ARTICLE INSPECTION CHECKLIST

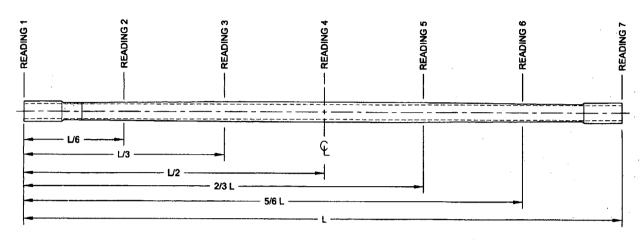
	spection Sheet wing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
	2.684	+0.005/-0.000	2.688			VERN	CNC-OB
1	2.748	+0.005/-0.000	2.751			4	
	2.884	+0.005/-0.000	2.886				
	3.019	+0.005/-0.000	3.024				
	3.163	+0.005/-0.000	3.168				
	3.308	+0.005/-0.000	3.312	/			
⋖	3.429	+0.005/-0.000	13.433	7,			
SIDE	2.990	+0.005/-0.000	2 993				
S	2.618	+0.005/-0.000	2.623				
						V	\forall
	0.200	+/-0.010	.200			·	
	R0.063	+/-0.010	.063	//		RC	R6
	R0.500	+/-0.010	500			R6	RG
	4.971	, +/-0.030	4.989	0		MERN	CNC 08
	2.684	+0.005/-0.000	2.688	//			
·	2.748	+0.005/-0.000	2,753				
	2.884	+0.005/-0.000	2.889				
	3.019	+0.005/-0.000	3,028	//			
	3.163	+0.005/-0.000	3.168				
	3.308	+0.005/-0.000	3.313				
8	3.429	+0.005/-0.000	3.432				
SIDE	2.990	+0.005/-0.000	2.994				
S	2.618	+0.005/-0.000	2.623				
	0.200	+/-0.010	. D 00			V	V
	R0.063	+/-0.010	.063			RG	<u>P6</u>
	R0.500	+/-0.010	.500	//		26.	RG.
	4.971	+/-0.030	4.994			YERN	CNC-08
	124.100	+/-0.020	124.100			tape	16-22

											DQA:	Date:		
NCR:	Yes	/ No				WORK ORDER NON-	COI	VFOR	MANCE / UPDATE		-			
									· · · · · · · · · · · · · · · · · · ·	(QA Closed:	Date:		
Nork Ord	or.					DISPOSITION		AGAINST DEPARTMENT/PROCESS						
voik ora	٠, .					Rework	٦		Skid-tube Crosstube Water Jet Engine					
Part I	No.					Scrap	1	1	Machining Small Fab	—	Proc	d. Eng. Coor.	Quality	
						Use-as-is		Thern	noforming Finishing		Rec/Stor	e/Packaging	Other	
NCR I	۱٥٠					Work Order Update	┛┆		Large Fab Composite			Supplier		
Root					Descr	ription of work order update	\top	l Initial	Action		Sign &			
Cause		Date	Step	Qty		or Non-conformance	- 1	nief Eng	Description		Date	Verification	QC Inspector	
oc/Data			•										·	
quip/Tooling										Ì				
perator														
laterial						•								
etup														
ther										- 1				
rocess							İ				<u>م</u>			
upplier				1						- 1				
raining														
napproved										- 1	1			
							FAUL	T CATE	GORY					
Landi	ng (Gear				General		_	•				_	
		Bending				Bend		Grain			Ovalized		Pressure/Forced	
		Centre No	t Concer	ntric to O	/s	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure	
		Cracks			^	Broken/Damaged		Inspect	ion incomplete		Part Incorred	ct	Weld	
		Crushed/0	Crimped.			Burrs		Instruct	ions Incomplete/Unclear		Part Lost/Mi	ssing	Wrong Stock Pulled	
		Cuffs				Contamination		Mainte	enance		Part Moved			
		Heat Trea	t			Countersink		Mislabe	eled		Positioned V	Vrong	_	
		Inspection	n Strip in	Tube		Cut Too Short		Misread	t		Power Loss/	Surge	Other	
		Ripples in	Bend			Drill Holes		Offset			:			
		Torque W	aves in E	xtrusion		Drawing		Out of	Calibration			· ·		
		Turning Se	equence			Finish		Out of	Sequence					
	Wave/Twist in Tube					Folio		Oútside	Dimensions					

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DART AEROSPACE LTD	Work Order:	87156
Description: Crosstube Assembly (412 High Aft)	Part Number:	D412-664-243
Inspection Dwg: D412-664-243 Rev: E		Page 2 of 2

WALL THICKNESS MEASUREMENT



	WALL	THICKNESS	MEASUREMEN	NT (IN)	Deviation		
Location	w1	w2	w3	w4	Δw (max-min)	TOLERANCE	
READING 1 L= 0"	.377	.383	.383	. 365	.018		
READING 2 L=	.308	.327.	.320	.303	.024		
READING 3 L=	,479	.492	.485	.477	.015		
READING 4 L=	635	643	,642	.631	.012	0.073"	
READING 5 L=	, 48 3	.490	,484	. 47/	.019		
READING 6 L=	.3/0	.328	.319	.298	.018		
READING 7 L=	,375	.383	.375	.361	.022		

Calibration Result

Actual Block Thickness: 100'500

Sitescan 250 Measured Thickness: _

Measured by:	Kc
Date:	12-7-22

Audited by: Date: **Preliminary Approval:** Date:

Rev	Date	Change	Revised by	Approved
Α	04.06.16	New Issue (P/O D412-664-203)	KJ/JLM	
В	06.03.09	Dwg Rev updated	KJ/JLM	1
С	07.05.08	Tolerance updated for dimension 4.971	KJ/JLM	
D	10.02.02	Dimension 124.100 was 124.09	KJ 🔥	11
Е	12.06.04	Wall thickness form added	KJ O	
			17)	

											DQA:	Date:		
NCR:	Yes	/ No				WORK ORDER NON-C	100	NFORM	AANCE / UPD	ATE ·				
											QA Closed:	Date:		
Work Ord	er:			·		DISPOSITION	DISPOSITION AGAINST D			AGAINST DE	EPARTMENT/PROCESS			
Part I	Part No. NCR No.					Rework Scrap Use-as-is Work Order Update Skid-tube Crosstube Machining Thermoforming Finishing Large Fab Composite			Small Fab Finishing	Water Jet Prod. Eng. Coor. Rec/Store/Packaging Supplier		Engineering Quality Other		
Root					Descri	ption of work order update	1	nitial	Actio	on	Sign &			
Cause		Date	Step	Qty	(or Non-conformance		ief Eng	Descrip	otion	Date	Verification	QC Inspector	
Doc/Data														
Equip/Tooling														
Operator]				ĺ								
Material														
Setup														
Other							·				1.3 %			
Process									,		رُيْ :			
Supplier			1	İ										
Training														
Unapproved		1												
						F	AUL	T CATE	GORY					
Landi	ing (Gear				General		_			_	<u></u>	_	
		Bending				Bend		Grain			Ovalized		Pressure/Forced	
	L	Centre No	ot Concer	ntric to	o/s	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure	
		Cracks				Broken/Damaged		Inspecti	on Incomplete		Part Incorre	ct	Weld	
	Crushed/Crimped. Burrs					Burrs		Instruct	ions Incomplete/Ur	nclear	Part Lost/M	issing	Wrong Stock Pulled	
	Cuffs					Contamination	Г	Mainte	nance		Part Moved		-	
1		Heat Trea	at			Countersink		Mislabe	led		Positioned \	N rong		
		Inspectio	n Strip in	Tube		Cut Too Short		Misread			Power Loss,	/Surge	Other	

Offset

Out of Calibration
Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Torque Waves in Extrusion

Drill Holes

Drawing

Finish Folio

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Item	Qty -243	Part Number	Description
1	х	D412-664-243	CROSSTUBE ASSEMBLY (412 HIGH AFT)
2	1	D6009-129	CROSSTUBE
3	2	D3595-063-570	RUBBER CUSHION
4	1	D2896-1	SUPPORT
5	2	D3189-1	CHAFING SHIELD
6	2	D2856-600-1009	ABRASION STRIP
7	4	MS21920-28	CLAMP
8	2,	MS21920-30	CLAMP (OR MS21920-32)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

1) MATERIAL: MANUFACTURED FROM D6009-129

FINISHED LENGTH = 124.100±0.020 (BEFORE BENDING/TRIMMING)

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2 PAINT OUTSIDE PER DART QSI 005 4.2

- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D412-664-243" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: 47.0 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
 12) INSTALL D2896-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE THE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 15) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES. NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

81154 pt 120712

@ DEO ATTACHED

E.	REORG TO CUR PAR 08- C8-3 & C	ANIZED VIEW RENT STAND 046 (ZN A6-3)	GENERAL NOTES; IS AND REFORMATTED DRAWING IDAROS; RELOCATED FLAG #6 PER; ADD TOLERANCE (ZN B6-3, C4-3, TURNING DETAIL & UPDATED ET 4.	RF	09.09.30					
D	REMO\	/E D2732-058	3, CHANGE TO D3595-063-570	PH	07.03.09					
С			0-1087, ADD D2732-058 & . MS21920-32 WAS MS21920-30	МВ	06.10.27					
В	ADD HO	DLES FOR C	РН	05.02.04						
Α	NEW IS	SUE		PH	01.10.17					
REV.	- 2		DESCRIPTION	BY	DATE					
DESIGN		PH	DART AEROSP	PACE LTD						
DRAWN		RF	HAWKESBURY, ONTAF	HAWKESBURY, ONTARIO, CANADA						
CHECK	D	97	DRAWING NO.		REV. E					
MFG. APPR.			D412-664-243	s	SHEET 1 OF 4					
APPRO	/ED	10	TITLE	TITLE SCALE						
DE APP	R.	-#	CROSSTUBE ASSEMBLY (412 HI AFT) NTS							

09.09.30

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NCR:	Yes	/ No				WORK ORDER NON-O	COI	NFORM	MANCE / UPI	DATE					
-											QA Closed:	Date:			
Work Ord	er:					DISPOSITION		AGAINST DEPARTMENT/PROCESS							
Part I	•				·····	Rework Scrap		Skid-tube Machining	Crosstube Small Fab	4	Water Jet d. Eng. Coor.	Engineering Quality			
NCR	No.					Use-as-is Work Order Update	├ ─ ┤ 1			Finishing Composite	Rec/Sto	re/Packaging Supplier	Other		
Root		Desc				ption of work order update		Initial	Act	tion	Sign &				
Cause		Date	Step	Qty	(or Non-conformance	Ch	nief Eng	Desci	ription	Date	Verification	QC Inspector		
Doc/Data															
Equip/Tooling															
Operator	Ш														
Material															
Setup															
Other			ŀ												
Process															
Supplier															
Training							1								
Unapproved			<u> </u>				<u> </u>		<u> </u>						
						F	AUI	T CATE	GORY						
Landi	ing (Gear				General		-		·	_		, - -1		
		Bending				Bend		Grain			Ovalized		Pressure/Forced		
		Centre N	ot Concei	ntric to	o/s	BOM/Route	_	Hardwa	re		Over/Under	tolerance	Temperature/Cure		
1	Ш	Cracks				Broken/Damaged		Inspect	ion Incomplete		Part Incorre	ct	Weld		
	Ш	Crushed/	Crimped.			Burrs		Instruct	ions Incomplete/	Unclear	Part Lost/M	issing	Wrong Stock Pulled		
		Cuffs				Contamination		Mainte	enance		Part Moved				
		Heat Trea	ət			Countersink		Mislabe	eled		Positioned \	Wrong	-		
	Inspection Strip in Tube					Cut Too Short		Misread	t		Power Loss/	'Surge	Other		
		Ripples ir	n Bend			Drill Holes		Offset							
		Torque V	Vaves in E	xtrusio	n [Drawing		Out of (Calibration	ė					
		Turning S	equence			Finish		Out of Sequence							

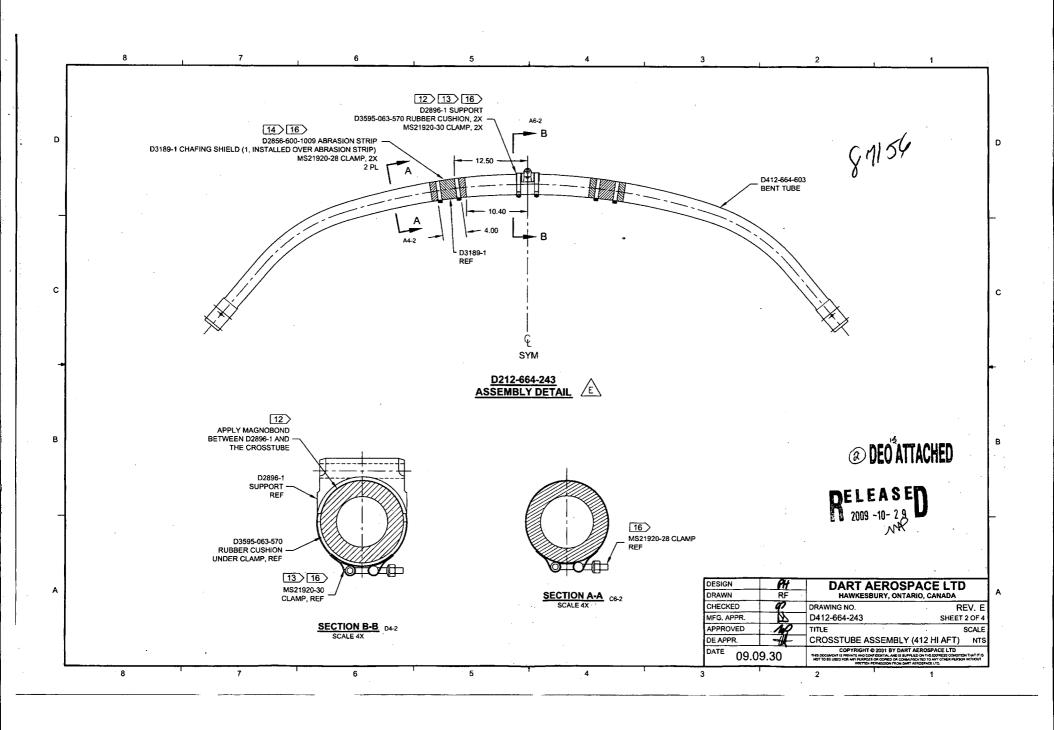
Outside Dimensions

DQA:

Date:

Wave/Twist in Tube

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G



											DQA:	Date:	
NCR:	Yes	/ No				WORK ORDER NON-CONFORMANCE / UPDATE QA Closed: Date:							
f						1					QA Closed:	Date:	
Work Ord	Work Order:					DISPOSITION AGAINST (PARTMENT	PROCESS	
Part No						Scrap Machining Use-as-is Thermoforming			Crosstube Small Fab Finishing omposite	Prod. Eng. Coor. Quality Rec/Store/Packaging Other			
Root		Descr				ption of work order update		nitial	Action		Sign &		
Cause		Date	Step	Qty	(or Non-conformance	Ch	ief Eng	Descripti	on	Date	Verification	QC Inspector
Doc/Data													ł
Equip/Tooling													
Operator													
Material													
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							AUI	T CATE	GORY				
Landi	_					General	_	1		<u></u>	,		٦ .
						Bend	1	Grain) —	Ovalized		Pressure/Forced
	Centre Not Concentric to O/S BOM/Ro						<u></u>	Hardwa		<u> </u>	Over/Under	}	Temperature/Cure
	\vdash	Cracks			<u> </u>	Broken/Damaged	<u></u>	1	on Incomplete	—	Part Incorre		Weld
	-	Crushed/	Crimped	-	<u> </u>	Burrs	\vdash	4	ions Incomplete/Uncl		Part Lost/M	ssing	Wrong Stock Pulled
	-	Cuffs			<u> </u>	Contamination		Mainte			Part Moved		
f	Heat Treat					Countersink	1	Mislabe	led	!	Positioned V	Vrong	

Misread

Out of Calibration

Out of Sequence

Outside Dimensions

Offset

Power Loss/Surge

Other

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Inspection Strip in Tube

Torque Waves in Extrusion

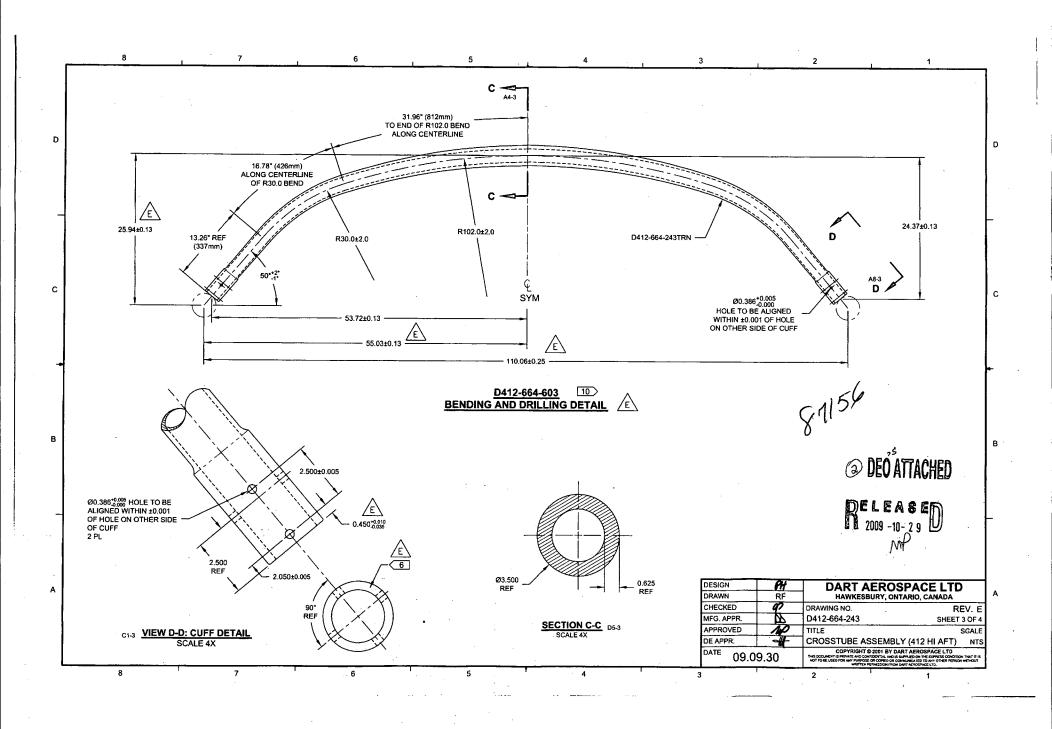
Cut Too Short

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G



									•		DQA:	Date:	
NCR:	Yes	/ No				WORK ORDER NON-CONFORMANCE / UPDATE							
											QA Closed:	Date:	
Work Ord	er.					DISPOSITION AGAINST DE			PARTMENT/PROCESS				
WOIK OIG	C1.					Rework			Skid-tube 0	Crosstube		Water Jet	Engineering
Part No.						Scrap			·	Small Fab	Pro	d. Eng. Coor.	Quality
						Use-as-is	i .	· —	Finishing	Rec/Stor	e/Packaging	Other	
NCR No.						Work Order Update			Large Fab C	omposite 🗌		Supplier	
Root		I		1	Descri	ption of work order update		Initial	Action		Sign &		
Cause		Date	Step	Qty		or Non-conformance	1	ief Eng	Descripti		Date	Verification	QC Inspector
Doc/Data			1	1 7.7			-		2 000				
Equip/Tooling	厂												
Operator	Г												
Material		1											
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Other											:		
Process]				·						l	
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						F	AUL	T CATE	GORY				
Landi	ng (Gear				General		,			1		_
	L	Bending				Bend		Grain			Ovalized		Pressure/Forced
		Centre N	ot Concei	ntric to	o/s	BOM/Route		Hardwa			Over/Under	 	Temperature/Cure
	Cracks					Broken/Damaged		Inspecti	on incomplete		Part Incorre	ct	Weld
	L	Crushed/	Crimped.			Burrs	\vdash	4	ions Incomplete/Uncl	ear	Part Lost/Mi	ssing	Wrong Stock Pulled
İ		Cuffs				Contamination		Mainte		<u> </u>	Part Moved		
		Heat Trea			<u>_</u>	Countersink		Mislabe			Positioned V		_
		Inspectio	n Strip in	Tube		Cut Too Short	$oxed{\bot}$	Misread	1		Power Loss/	Surge	Other
	Ripples in Bend Drill Holes				Drill Holes	1	Offset						

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

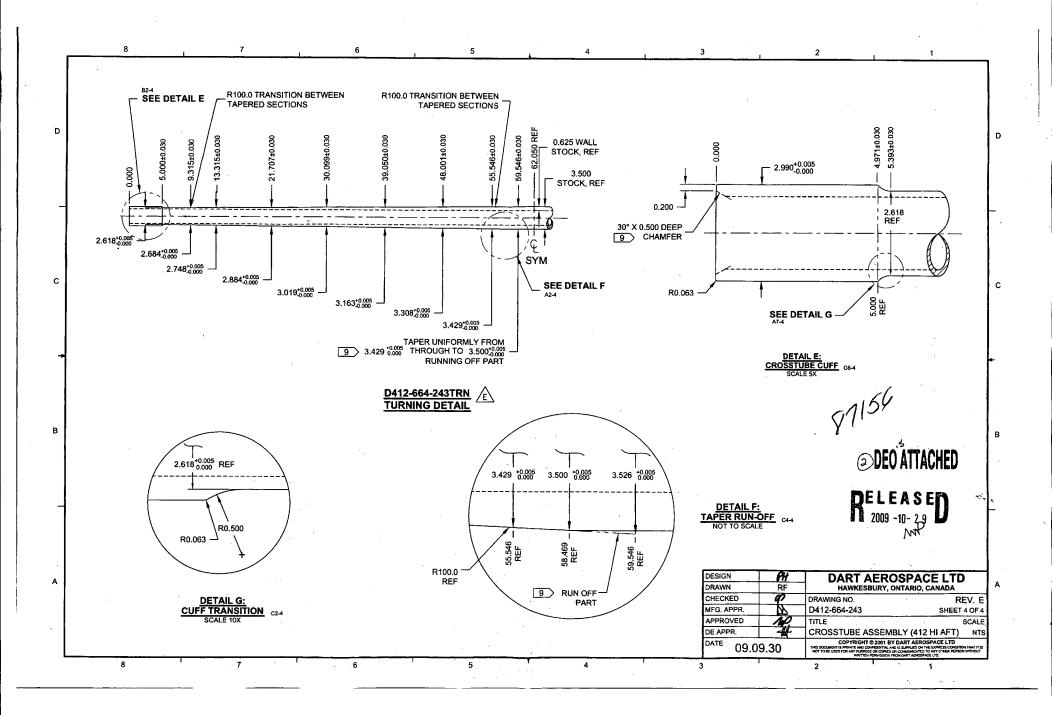
Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G



									• •		DQA:	Date:		
NCR:	Yes	/ No				WORK ORDER NON-CONFORMANCE / UPDATE								
											QA Closed:	Date:		
Work Order:						DISPOSITION AGAINST DE						EPARTMENT/PROCESS		
	-					Rework]	1	+	crosstube		Engineering		
Part f	Part No.					Scrap	-		~ 	Small Fab		d. Eng. Coor.	Quality	
NCR I	NCR No.					Use-as-is Thermoforming Finishing Work Order Update Large Fab Composite				Rec/Store/Packaging Other Supplier				
Root					Descri	ption of work order update		nitial	Action		Sign &			
Cause		Date	Step	Qty		or Non-conformance	Ch	ief Eng	Description	on	Date	Verification	QC Inspector	
Doc/Data						(6)								
Equip/Tooling														
Operator										·				
Material										·				
Setup				ļ										
Other														
Process				•										
Supplier														
Training		*												
Unapproved														
						F	AUL	T CATE	GORY					
Landi	ng G	iear				General		-		·	•		-	
		Bending			<u> </u>	Bend	L	Grain			Ovalized		Pressure/Forced	
	Centre Not Concentric to O/S BOM/Route					BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure	
		Cracks				Broken/Damaged		inspect	on Incomplete		Part Incorre	ct	Weld	
	Ш	Crushed/0	Crimped.			Burrs		Instruct	ions Incomplete/Uncle	ear	Part Lost/Mi	ssing	Wrong Stock Pulled	
	Ш	Cuffs				Contamination		Mainte	enance		Part Moved			
1	Heat Treat Co					Countersink		Mislabe	eled		Positioned V	Vrong		

Misread

Out of Calibration

Out of Sequence

Outside Dimensions

Offset

Power Loss/Surge

Other

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Inspection Strip in Tube

Torque Waves in Extrusion

Cut Too Short

Drill Holes

Drawing

Finish Folio

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DRAWING NO.	TITLE	REV. E	DART AEROSPACE LTD	D.E.O. NO.	SHEET NO.	SCALE
D412-664-243	CROSSTUBE ASSEMBL	Y (412 HI AFT)	ENGINEERING ORDER	D412-664-243-E-1	SHEET 1 OF 2	NTS
DRAWN	CHECKED	M	MFG. APPR.	APPROVED MAP	DE APPR.	
DATE 11.0	3.31 DATE)	1/03.31	DATE //.03.31	DATE 11/03·3)	DATE 11-03.31	

PURPOSE:

REMOVED ABRASION STRIP IN FAVOR OF A THIN LAYER OF PROSEAL 890.

CHANGE:

PARTS LIST IS AMENDED AS FOLLOWS:

<u>IS:</u>

item	Qty -243	Part Number	Description
6	0	D2856-600-1009	ABRASION STRIP

WAS:

6	2	D2856-600-1009	ABRASION STRIP

NOTES 2 AND 14, SHEET 1 ARE AMENDED AS FOLLOWS:

IS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA)

PAINT OUTSIDE PER DART QSI 005 4.2

AFTER PAINTING, APPLY CLEAR COAT ON HATCHED AREA

14) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3189-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D3189-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2 PAINT OUTSIDE PER DART QSI 005 4.2
- 14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.

87154



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											DQA:	Date:	
NCR:	Yes	/ No				WORK ORDER NON-C							
											QA Closed:	Date:	
Work Ord	er:					DISPOSITION		AGAINST D			PARTMENT	PROCESS	
Part No						Rework Scrap Use-as-is Work Order Update	Machining Small Fa Thermoforming Finishir			Crosstube Small Fab Finishing Composite	Pro Rec/Stor	Engineering Quality Other	
Root		Descrip				ption of work order update		Initial	Action		Sign &		
Cause		Date	Step	Qty	(or Non-conformance C		nief Eng	Descrip	tion	Date	Verification	QC Inspector
Doc/Data				:									
Equip/Tooling										•			
Operator													
Material													
Setup													
Other	Г												
Process												-	
Supplier													
Training					ľ								
Unapproved											<u> </u>		
						F.	AUI	T CATE	GORY				
Landi	ing (Gear				General		_			_		_
j		Bending				Bend		Grain			Ovalized		Pressure/Forced
		Centre No	o/s	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure		
		Cracks				Broken/Damaged		Inspecti	on Incomplete		Part Incorre	ct	Weld
		Crushed/	Crimped.			Burrs		Instruct	ions Incomplete/Un	clear	Part Lost/Mi	issing	Wrong Stock Pulled
		Cuffs				Contamination		Mainte	nance		Part Moved		
		Heat Trea	it			Countersink		Mislabe	led		Positioned V	Vrong	
	Inspection Strip in Tube					Cut Too Short		Microso	ı		Power Loss	Surgo	Other

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

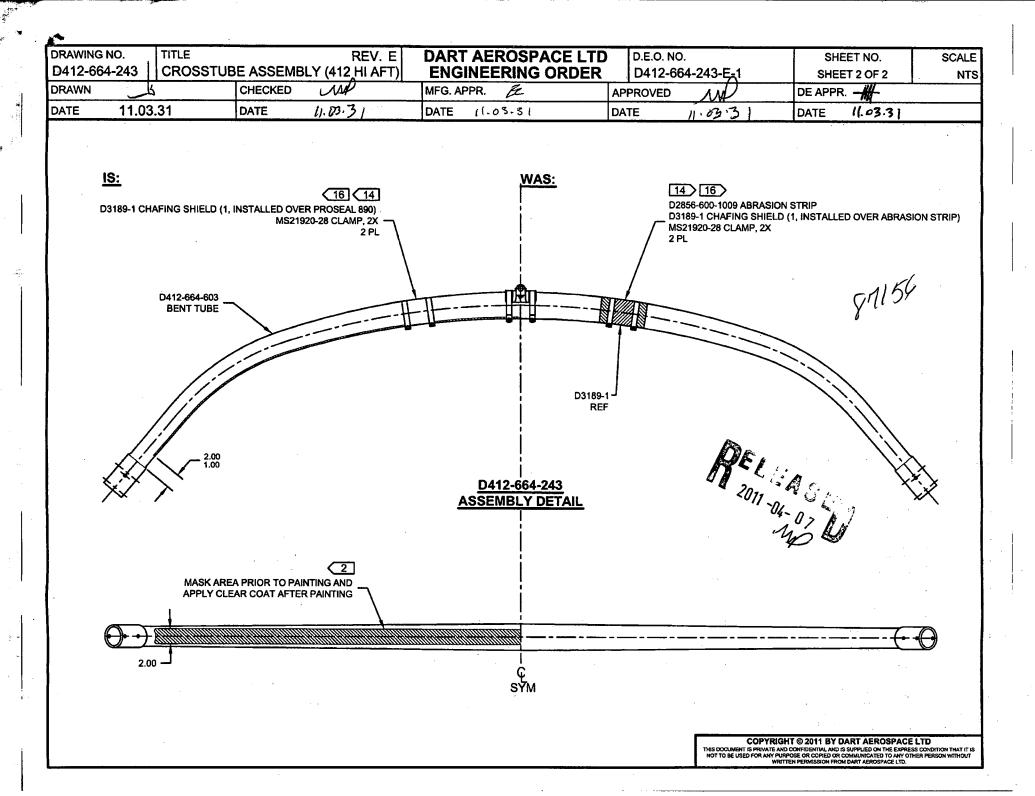
Torque Waves in Extrusion

Drill Holes

Drawing

Finish

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								DQA:	Date:			
NCR: Ye	es / No			WORK ORDER NO	WORK ORDER NON-CONFORMANCE / UPDATE				Date:	3		
Work Order:	:			DISPOSITION		AGAINST DEPARTMENT/PROCESS						
Part No	D			Scrap	Rework Skid-tube Scrap Machining		Crosstube Small Fab	Water Jet Engineering Prod. Eng. Coor. Quality Rec/Store/Packaging Other		Quality		
NCR No.				Use-as-is Work Order Update				Rec/Stol	Supplier	Other		
Root				Description of work order update	Initial	Ad	Action					
Cause	Date	Step	Qty	or Non-conformance	Chief Er	ng Desc	cription	Date	Verification	QC Inspector		
Doc/Data				* 4								
Equip/Tooling	٠,									•		
Operator										·		
Material		1										
Setup									:			

General **Landing Gear** Pressure/Forced Grain Bending Bend Ovalized Centre Not Concentric to O/S BOM/Route ... Over/Under tolerance Temperature/Cure Hardware Cracks Broken/Damaged Part Incorrect Weld Inspection Incomplete Crushed/Crimped Instructions Incomplete/Unclear Part Lost/Missing Wrong Stock Pulled Burrs Cuffs Contamination Maintenance Part Moved Countersink Mislabeled Positioned Wrong Heat Treat Other Inspection Strip in Tube Cut Too Short Misread Power Loss/Surge Drill Holes Ripples in Bend 🦄 Offset Torque Waves in Extrusion Out of Calibration Drawing Turning Sequence Finish Out of Sequence Wave/Twist in Tube Folio **Outside Dimensions**

FAULT CATEGORY

Other
Process
Supplier
Training
Unapproved